

REMARKS

Claim Rejections - 35 USC § 103

Claims 14-16, and 19-21 were rejected under 35 U.S.C. 103(a) as being unpatentable over Li (WO 02/031463 A2, April 18, 2002) in view of DeNuzzio et al. (WO 2004/001404 A1, published on December 31, 2003 and filed on June 19, 2003).

This rejection is respectfully traversed and should be withdrawn as claim 14 now contains the limitation of claim 18.

Claims 1-4, 7-12, 14-16, and 19-21 were rejected under 35 U.S.C. 103(a) as being unpatentable over Li (Wo 02/031463 A2, April 18, 2002) in view of DeNuzzio et al (WO 2004/001404 A1, published on December 31, 2003 and filed on June 19, 2003), Chazalviel et al. (*Applied Spectroscopy*, 1993, Vol. 47, pp. 1411-1416), and Yoshida et al. (JP 07-184883 A, July 25, 1995).

This rejection is respectfully traversed.

The Examiner acknowledges that Li, DeNuzzio and Chazalviel fail to disclose a waveguide total internal reflection prism. The Examiner relies on Yoshida to fill this gap. Claim 1 has been amended to recite "a microfluidic trench to contain a target molecule ... wherein the waveguide total internal reflection prism is coupled to the microfluidic trench." These features are disclosed in paragraph [0047] of the specification. Yoshida, as well as the other cited references, fail to disclose the "the waveguide total internal reflection prism is coupled to the microfluidic trench." In Yoshida, the ATR prism 2 is placed over the biosample 12, but the ATR prism 2 is not coupled to a microfluidic trench.

Claim 13 was rejected under 35 U.S.C. 103(a) as being unpatentable over Li (WO 02/031463 A2, April 18, 2002) in view of DeNuzzio et al (WO 2004/001404 A1, published on December 31, 2003 and filed on June 19, 2003), Chazalviel et al (*Applied Spectroscopy*, 1993, Vol.

47, pp. 1411-1416), and Yoshida et al. (JP 07-184883 A, July 25, 1995) as applied to claims 1 and 10 above, and further in view of Dai et al. (U.S. Patent No. 6,528,020, March 4, 2003).

This rejection is respectfully traversed and should be withdrawn as claim 13 depends from claim 1, which should now be allowable.

Claim 18 was rejected under 35 U.S.C. 103(a) as being unpatentable over Li (WO 02/031463 A2, April 18, 2002) in view of DeNuzzio et al (WO 2004/001404 A1, published on December 31, 2003 and filed on June 19, 2003) as applied to claim 14 above, and further in view of Ito (U.S. Patent No. 5,384,028, January 24, 1995).

This rejection is respectfully traversed.

The Examiner relies on Ito for teaching a biosensor with a memory for storing data. However, as explained in paragraph [0004], prior to this invention there was “no sensor array integrated circuits exist which many different sensors to perform diagnosis and hazardous chemical analysis. Further, no sensor array integrated circuits exist that are co-integrated with electronic circuits to perform data storage, data analysis and/or data transfer/receiving.” While Ito discloses a biosensor with a memory for storing data, the combination of Ito with the other cited references would still not have taught or motivated a person of ordinary skill in the art to arrive at the claimed sensor array integrated circuits having many different sensors to perform diagnosis and hazardous chemical analysis, wherein the sensor array integrated circuits exist such that they are co-integrated with electronic circuits to perform data storage, data analysis and/or data transfer/receiving.

Furthermore, prior to this invention, there existed *no* “hand-held device” (see Figure 1 of the specification) that could “solve the problem of response time” between collection of samples and analysis in a lab. See paragraph [0013] of the specification. The apparatus of claim 14 could be made as a hand-held device because of the integration of the *all* of the following features within a hand-held device:

a microfluidic trench to contain one or more target molecules (disclosed in paragraph [0047] and Figure 2B of the specification);
an array addressed device including a plurality of addressable cells, each of the plurality of addressable cells including a first electrode and a second electrode, wherein a first tip of the first electrode is located in the microfluidic trench and electronically coupled to a first trace via a first conductive plug and a second tip of the second electrode is located in the microfluidic trench and electronically coupled to a second trace via a second conductive plug (disclosed in paragraph [0047] and Figure 2B of the specification);
an electrochemical detector;
a spectroscopy optically coupled to the array addressed device, wherein the plurality of addressable cells comprise a plurality of sensor elements wherein each of the sensor elements is functionalized to interact with the one or more target molecules;
a control circuitry coupled to the sensor elements, wherein the control circuitry is configured to detect interactions of the sensor elements with the one or more target molecules; and
memory coupled to the control circuitry, wherein the control circuitry is configured to store data corresponding to the plurality of sensor elements in the memory.

Prior to this invention, the cited references *as a whole* fail to teach or suggest integrating *all* of the above features within a hand-held device. Applicants respectfully submit that all of above the features could be integrated within the claimed hand-held device of claim 14 by the unique configuration of the features such as “a first tip of the first electrode is located in the microfluidic trench and electronically coupled to a first trace via a first conductive plug and a second tip of the second electrode is located in the microfluidic trench and electronically coupled to a second trace via a second conductive plug” which is nowhere disclosed in the cited prior art.

As explained in paragraph [0014], “[e]mbodiments of the invention can solve the problem of rapidly accessing and reading information regarding reactivity to a large series of specific functional groups and their combinations.” Applicants respectfully submit that the Examiner should consider the advantages of the claimed hand-held device of claim 14 in comparison with the prior art devices wherein *in-situ* analysis of a sample immediately after collection was *not* possible. For example, consider a person having had a heart attack. With the

claimed hand-held device of claim 14, it would be possible to do a rapid biological profile of the person's blood immediately by the paramedics who arrive in response to the emergency. On the other hand, by the prior art devices, it would take several hours, if not several days, before the results of the person's blood could be analyzed.

In view of the above amendment, applicant believes the pending application is in condition for allowance.

In the event the U.S. Patent and Trademark Office determines that an extension is required, applicant petitions for any required relief including extensions of time and authorizes the Commissioner to charge the cost of such petitions and/or other fees due in connection with the filing of this document to Deposit Account No. 04-0100 referencing docket no. 21058/0206743-US0.

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